



Example 180.

A two-component polymerization system was prepared giving a reactant ratio of monomer:procatalyst:activator = 25,000:1:2. Component A: LiWCA-H (9 mg) was dissolved in 0.7g of triethoxysilylnorbornene and 19 g of rubberized hexylnorbornene (1 wt. % EPDM). Component B: 2.5 mg (π -allyl)Pd(O₂CCF₃)PCy₃ was dissolved in 0.3 g triethoxysilylnorbornene. A and B components were mixed at 70°C. The following reaction parameters describe the reaction: $t_{\text{gel}} = 230$ s, $t_{108^\circ\text{C}} = 230$ s, $t_{203^\circ\text{C}} = 345$ s, $t_{\text{Tmax}} = 465$ s, $t_{\text{gel}} = 108^\circ\text{C}$, $t_{\text{Tmax}} = 253^\circ\text{C}$. A solid puck was obtained. Yield by TGA = 93.9%.

Example 181.

A two-component polymerization system was prepared giving a reactant ratio of monomer:procatalyst:activator = 25,000:1:2. Component A: LiWCA-H (2.4 mg) was dissolved in 0.7g of triethoxysilylnorbornene and 19 g of rubberized hexylnorbornene (1 wt. % EPDM). Component B: 1.7 mg (π -allyl)Pd(O₂CCF₃)P(*i*-Pr)₃ was dissolved in 1 g hexylnorbornene. A and B components were mixed at 53°C. The following reaction parameters describe the reaction: $t_{\text{gel}} = 8$ and $t_{\text{Tmax}} = 255^\circ\text{C}$. A solid puck was obtained. Yield by TGA = 96.7%.

Example 182.

A two-component polymerization system was prepared giving a reactant ratio of monomer:procatalyst:activator = 20,000:1:1. Component A: LiWCA-H (4 mg) was dissolved in 9 g of ethylnorbornene. Component B: 1.9 mg (π -allyl)Pd(O₃SCF₃)P(*i*-Pr)₃ was dissolved in 3 g ethylnorbornene. The activator/monomer solution was degassed under vacuum prior to mixing with the procatalyst. A and B components were mixed at 23°C. The following reaction parameters describe the reaction:

$t_{\text{gel}} = 390 \text{ s}$, $t_{100^\circ\text{C}} = 407 \text{ s}$, $t_{204^\circ\text{C}} = 415 \text{ s}$, $t_{\text{Tmax}} = 425 \text{ s}$, $t_{\text{gel}} = 51^\circ\text{C}$, $t_{\text{Tmax}} = 213^\circ\text{C}$. A solid puck was obtained.

Example 183.

- 5 A two-component polymerization system was prepared giving a reactant ratio of monomer:procatalyst:activator = 20,000:1:1. Component A: LiWCA-H (3.4 mg) was dissolved in 1.0 g butylnorbornene. Component B: 1.5 mg (allyl)Pd(O₃SCF₃)P(i-pr)₃ was dissolved in 8.5 g butylnorbornene and 0.31 g norbornadiene. A and B components were
10 mixed at 25°C. A solid object was obtained. Yield by TGA = 94.1%. Swell in toluene overnight: 158%.

Example 184.

- 15 A two-component polymerization system was prepared giving a reactant ratio of monomer:procatalyst:activator = 20,000:1:1. Component A: LiWCA-H (3.4 mg) was dissolved in 1.0 g butylnorbornene. Component B: 1.4 mg (allyl)Pd(O₂CCF₃)P(i-pr)₃ was dissolved in 9.0 g butylnorbornene. A and B components were mixed at 25°C and the following reaction parameters describe the reaction: $t_{\text{gel}} = 4:00 \text{ min.}$,
20 $t_{100^\circ\text{C}} = 4:37 \text{ min.}$, $t_{200^\circ\text{C}} = 4:40 \text{ min.}$, $t_{\text{Tmax}} = 5:00 \text{ min.}$, $t_{\text{gel}} = 38^\circ\text{C}$, $t_{\text{Tmax}} = 210^\circ\text{C}$. A solid object was obtained. Yield by TGA = 96.7%.

Example 185.

- 25 A two-component polymerization system was prepared giving a reactant ratio of monomer:procatalyst:activator = 20,000:1:2. Component A: LiFABA (5.8 mg) was dissolved in 0.71 g triethoxysilylnorbornene. Component B: 1.4 mg (allyl)Pd(O₂CCF₃)P(i-pr)₃ was dissolved in 9.5 g butylnorbornene. A and B components were mixed at 45°C and the following reaction parameters describe the reaction: $t_{\text{gel}} = 20 \text{ s}$, $t_{100^\circ\text{C}} =$

23 s, $t_{200^{\circ}\text{C}} = 24$ s, $t_{T_{\text{max}}} = 30$ s, $t_{\text{gel}} = 71^{\circ}\text{C}$, $t_{T_{\text{max}}} = 222^{\circ}\text{C}$. A solid object was obtained. Yield by TGA = 94.4%.

Example 186.

5 A two-component polymerization system was prepared giving a reactant ratio of monomer:procatalyst:activator = 20,000:1:2. Component A: LiFABA (5.8 mg) was partially dissolved in 0.71 g triethoxysilylnorbornene. Component B: 1.4 mg (allyl)Pd(P(*i*-Pr)₃)P(*i*-pr)₃ was dissolved in 9.5 g butylnorbornene. A and B components were
10 opened to the air, stirred for 5 min., mixed at 25°C and the following reaction parameters describe the reaction: $t_{\text{gel}} = 3:00$, $t_{100^{\circ}\text{C}} = 3:36$ min., $t_{T_{\text{max}}} = 4:00$ min., $t_{\text{gel}} = 40^{\circ}\text{C}$, $t_{T_{\text{max}}} = 197^{\circ}\text{C}$. A solid object was obtained. Yield by TGA = 95.9%.

Example 187.

15 A two-component polymerization system was prepared giving a reactant ratio of monomer:procatalyst:activator = 20,000:1:1. Component A: LiWCA-H (3.4 mg) was partially dissolved in 1.0 g butylnorbornene. Component B: 1.4 mg (allyl)Pd(O₂CCF₃)P(*i*-pr)₃ was dissolved in 9.0 g
20 butylnorbornene. A and B components were mixed at 45°C and the following reaction parameters describe the reaction: $t_{\text{gel}} = 17$ s, $t_{100^{\circ}\text{C}} = 21$ s, $t_{200^{\circ}\text{C}} = 22$ s, $t_{T_{\text{max}}} = 40$ s, $t_{\text{gel}} = 58^{\circ}\text{C}$, $t_{T_{\text{max}}} = 222^{\circ}\text{C}$. A solid object was obtained. Yield by TGA = 92.3%.

Example 188.

25 A two-component polymerization system was prepared giving a reactant ratio of monomer:procatalyst:activator = 20,000:1:1. Component A: LiWCA-H (3.4 mg) was dissolved in 1.0 g butylnorbornene. Component B: 1.5 mg (allyl)Pd(O₃SCF₃)P(*i*-pr)₃ was dissolved in 8.9 g
30 butylnorbornene and 0.10 g dicyclopentadiene. A and B components

were mixed at 25°C and the following reaction parameters describe the reaction: $t_{\text{gel}} = 12$ s, $t_{100^\circ\text{C}} = 16$ s, $t_{200^\circ\text{C}} = 20$ s, $t_{\text{Tmax}} = 45$ s, $t_{\text{gel}} = 40^\circ\text{C}$, $t_{\text{Tmax}} = 213^\circ\text{C}$. A solid object was obtained. Yield by TGA = 96.4%.

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Example 189.

LiWCA-H (3.4 mg) and 1.4 mg (allyl)Pd(O₂CCF₃)P(i-pr)₃ were combined in 1 ml methylene chloride and stirred for several minutes. This was added to 10.0 g butylnorbornene (reactant ratio of monomer:procatalyst:activator = 20,000:1:1) at 25°C and the following reaction parameters describe the reaction: $t_{\text{gel}} = 1:00$ min., $t_{100^\circ\text{C}} = 1:10$ min., $t_{200^\circ\text{C}} = 1:12$ min., $t_{\text{Tmax}} = 1:30$ min., $t_{\text{gel}} = 40^\circ\text{C}$, $t_{\text{Tmax}} = 209^\circ\text{C}$. A solid object was obtained. Yield by TGA = 96.3%.

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Example 190.

LiFABA (5.8 mg) and 1.4 mg (allyl)Pd(O₂CCF₃)P(i-pr)₃ were combined in 0.25 ml methylene chloride and stirred for several minutes. This solution was added to 10.0 g butylnorbornene (reactant ratio of monomer:procatalyst:activator = 20,000:1:2) at 45°C and the following reaction parameters describe the reaction: $t_{\text{gel}} = 5$ s, $t_{100^\circ\text{C}} = 7$ s, $t_{200^\circ\text{C}} = 9$ s, $t_{\text{Tmax}} = 25$ s, $t_{\text{gel}} = 60^\circ\text{C}$, $t_{\text{Tmax}} = 222^\circ\text{C}$. A solid object was obtained. Yield by TGA = 92.6%.

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Example 191.

A two-component polymerization system was prepared giving a reactant ratio of monomer:procatalyst:activator = 20,000:1:1. Component A: LiWCA-H (3.4 mg) was dissolved in 1.0 g butylnorbornene. Component B: 1.8 mg (allyl)Pd(O₃SCF₃)P(cyclopentyl)₃ was dissolved in 9.0 g butylnorbornene. A and B components were mixed at 25°C and the following reaction parameters describe the reaction: $t_{\text{gel}} = 23$ s, $t_{100^\circ\text{C}} =$

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29 s, $t_{200^{\circ}\text{C}} = 30$ s, $t_{\text{Tmax}} = 50$ s, $t_{\text{gel}} = 49^{\circ}\text{C}$, $t_{\text{Tmax}} = 217^{\circ}\text{C}$. A solid object was obtained. Yield by TGA = 96.3%.

Example 192.

5 A two-component polymerization system was prepared giving a reactant ratio of monomer:procatalyst:activator = 20,000:1:2. Component A: LiFABA (5.8 mg) was dissolved in 0.71 g triethoxysilylnorbornene. Component B: 1.8 mg (allyl)Pd(O₃SCF₃)P(cyclopentyl)₃ was dissolved in 9.0 g butylnorbornene. A and B components were mixed at 25°C and the
10 following reaction parameters describe the reaction: $t_{\text{gel}} = 29$ s, $t_{100^{\circ}\text{C}} = 36$ s, $t_{200^{\circ}\text{C}} = 38$ s, $t_{\text{Tmax}} = 60$ s, $t_{\text{gel}} = 65^{\circ}\text{C}$, $t_{\text{Tmax}} = 226^{\circ}\text{C}$. A solid object was obtained. Yield by TGA = 94.2%.

Example 193.

15 A two-component polymerization system was prepared giving a reactant ratio of monomer:procatalyst:procatalyst:activator = 20,000:0.5:0.5:1. Component A: LiWCA-H (3.4 mg) was dissolved in 1.0 g butylnorbornene. Component B: 0.7 mg (allyl)Pd(O₂CCF₃)P(i-pr)₃ and 0.8 mg (allyl)Pd(O₃SCF₃)P(i-pr)₃ were dissolved in 9.0 g
20 butylnorbornene. A and B components were mixed at 25°C and the following reaction parameters describe the reaction: $t_{\text{gel}} = 23$ s, $t_{100^{\circ}\text{C}} = 30$ s, $t_{200^{\circ}\text{C}} = 34$ s, $t_{\text{Tmax}} = 50$ s, $t_{\text{gel}} = 43^{\circ}\text{C}$, $t_{\text{Tmax}} = 207^{\circ}\text{C}$. A solid object was obtained. Yield by TGA = 94.9%.

Example 194.

25 A two-component polymerization system was prepared giving a reactant ratio of monomer:procatalyst:activator = 20,000:1:1. Component A: LiWCA-H (3.4 mg) was dissolved in 1.0 g butylnorbornene. Component B: 1.8 mg (allyl)Pd(O₃SCF₃)P(cyclopentyl)₃ was dissolved
30 in 8.5 g butylnorbornene and 0.5 g butenylnorbornene. A and B

components were mixed at 25°C and the following reaction parameters describe the reaction: $t_{\text{gel}} = 15$ s, $t_{100^\circ\text{C}} = 19$ s, $t_{200^\circ\text{C}} = 21$ s, $t_{\text{Tmax}} = 40$ s, $t_{\text{gel}} = 52^\circ\text{C}$, $t_{\text{Tmax}} = 221^\circ\text{C}$. A solid object was obtained. Yield by TGA = 95.7%.

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Example 195.

A two-component polymerization system was prepared giving a reactant ratio of monomer:procatalyst:activator = 20,000:1:1. Component A: LiWCA-H (3.4 mg) was dissolved in 1.0 g butylnorbornene.

10 Component B: 1.8 mg (allyl)Pd(O₃SCF₃)P(cyclopentyl)₃ was dissolved in 8.0 g butylnorbornene and 1.0 g butenylnorbornene. A and B components were mixed at 25°C and the following reaction parameters describe the reaction: $t_{\text{gel}} = 23$ s, $t_{100^\circ\text{C}} = 26$ s, $t_{200^\circ\text{C}} = 29$ s, $t_{\text{Tmax}} = 40$ s, $t_{\text{gel}} = 58^\circ\text{C}$, $t_{\text{Tmax}} = 223^\circ\text{C}$. A solid object was obtained. Yield by TGA = 15 96.4%.

Example 196.

A two-component polymerization system was prepared giving a reactant ratio of monomer:procatalyst:activator = 50,000:1:1. Component

20 A: LiWCA-H (1.3 mg) was dissolved in 1.0 g butylnorbornene. Component B: 0.7 mg (allyl)Pd(O₃SCF₃)P(cyclopentyl)₃ was dissolved in 9.0 g butylnorbornene. A and B components were mixed at 25°C and the following reaction parameters describe the reaction: $t_{\text{gel}} = 37$ s, $t_{100^\circ\text{C}} = 49$ s, $t_{200^\circ\text{C}} = 54$ s, $t_{\text{Tmax}} = 1:10$ min., $t_{\text{gel}} = 44^\circ\text{C}$, $t_{\text{Tmax}} = 210^\circ\text{C}$. A solid 25 object was obtained. Yield by TGA = 94.8%.

Example 197.

A two-component polymerization system was prepared giving a reactant ratio of monomer:procatalyst:activator = 100,000:1:1.

30 Component A: LiWCA-H (5.0 mg) was dissolved in 74 g

butylnorbornene. Component B: 2.3 mg (allyl)Pd(O₃SCF₃)P(i-pr)₃ was dissolved in 9.0 g butylnorbornene. A and B components were mixed at 40°C and the following reaction parameters describe the reaction: $t_{\text{gel}} = 18 \text{ s}$, $t_{100^\circ\text{C}} = 35 \text{ s}$, $t_{200^\circ\text{C}} = 47 \text{ s}$, $t_{\text{Tmax}} = 1:00 \text{ min.}$, $t_{\text{gel}} = 58^\circ\text{C}$, $t_{\text{Tmax}} = 215^\circ\text{C}$. A solid object was obtained. Yield by TGA = 86.2%

Example 198.

A two-component polymerization system was prepared giving a reactant ratio of monomer:procatalyst:activator = 100,000:1:2. Component A: LiFABA (8.7 mg) was dissolved in 1.0 g triethoxysilylnorbornene. Component B: 2.3 mg (allyl)Pd(O₃SCF₃)P(i-pr)₃ was dissolved in 74 g butylnorbornene. A and B components were mixed at 45°C and the following reaction parameters describe the reaction: $t_{\text{gel}} = 27 \text{ s}$, $t_{100^\circ\text{C}} = 52 \text{ s}$, $t_{200^\circ\text{C}} = 60 \text{ s}$, $t_{\text{Tmax}} = 1:10 \text{ min.}$, $t_{\text{gel}} = 55^\circ\text{C}$, $t_{\text{Tmax}} = 216^\circ\text{C}$. A solid object was obtained. Yield by TGA = 89.3%

Example 199.

A two-component polymerization system was prepared giving a reactant ratio of monomer:procatalyst:activator = 20,000:1:1. Component A: LiWCA-H (3.2 mg) was dissolved in 1.0 g tetracyclododecadiene. Component B: 1.4 mg (allyl)Pd(O₃SCF₃)(P-i-Pr)₃ was dissolved in 9.0 g tetracyclododecadiene. A and B components were mixed at 25°C and the following reaction parameters describe the reaction: $t_{\text{gel}} = 18 \text{ s}$, $t_{100^\circ\text{C}} = 27 \text{ s}$, $t_{\text{Tmax}} = 50 \text{ s}$, $t_{\text{gel}} = 40^\circ\text{C}$, $t_{\text{Tmax}} = 163^\circ\text{C}$. A solid object was obtained. Yield by TGA = 89.7%.

Example 200.

A two component polymerization system was prepared giving a reactant ratio of monomer:procatalyst:activator = 20,000:1:1. Component A: LiWCA-H (3.4 mg) was dissolved in 1.0 g butylnorbornene. A stock solution of Component B: 15.3 mg (π -allyl)Pd(O₃SCF₃)(P(*i*-Pr)₃) was dissolved in 90.0 g butylnorbornene. Component A was mixed with 9.0 g Component B at 25°C and the following reaction parameters describe the reaction: $t_{\text{gel}} = 14$ s, $t_{100^\circ\text{C}} = 17$ s, $t_{200^\circ\text{C}} = 22$ s, $t_{\text{Tmax}} = 45$ s, $T_{\text{gel}} = 50^\circ\text{C}$, $t_{\text{Tmax}} = 214^\circ\text{C}$. A solid object was obtained. Yield by TGA = 97.8%.

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The stock solution of Component B was stored at room temperature in a dry box in the dark for four months.

A two component polymerization system was prepared giving a reactant ratio of monomer:procatalyst:activator = 20,000:1:1. Component A: LiWCA-H (3.4 mg) was dissolved in 1.0 g butylnorbornene. Component B: 9.0 g “aged” stock solution. A and B were mixed at 25°C and the following reaction parameters describe the reaction: $t_{\text{gel}} = 22$ s, $t_{100^\circ\text{C}} = 30$ s, $t_{200^\circ\text{C}} = 33$ s, $t_{\text{Tmax}} = 45$ s, $T_{\text{gel}} = 40^\circ\text{C}$, $t_{\text{Tmax}} = 213^\circ\text{C}$. A solid object was obtained. Yield by TGA = 96.9%.

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Example 201.

A two component polymerization system was prepared giving a reactant ratio of monomer:procatalyst:activator = 20,000:1:1. Component A: LiWCA-H (3.4 mg) was dissolved in 1.0 g butylnorbornene. Component B: 1.6 mg (crotyl)Pd(O₃SCF₃)(P(*i*-Pr)₃) was dissolved in 9.0 g butylnorbornene. A and B components were mixed at 25°C and the following reaction parameters describe the reaction: $t_{\text{gel}} = 80$ s, $t_{100^\circ\text{C}} = 90$ s, $t_{200^\circ\text{C}} = 94$ s, $t_{\text{Tmax}} = 110$ s, $T_{\text{gel}} = 38^\circ\text{C}$, $t_{\text{Tmax}} = 210^\circ\text{C}$. A solid object was obtained. Yield by TGA = 97.7%.

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